



Strategies for Coping with Enemy Weapons of Mass Destruction

DR BARRY R. SCHNEIDER



A FEW STATES now constitute a most compelling and dangerous threat to US and allied security in the Middle East, North Africa, the Persian Gulf, and Northeast Asia. One can describe these most threatening of enemy states with a common acronym: nuclear, biological, and chemical (NBC)-arming sponsors of terrorism and intervention

(NASTI). Each is pursuing an NBC weapons capability as well as the means of delivering these weapons.¹ Each seeks to conquer or overturn the governments of one or more neighboring states. Each is a state sponsor of international terrorist activities.² Each is overtly hostile to the US and one or more of its key allies. Each follows a “nasty” policy of threats and acts of violence against regional and domestic opponents.

Just who are these NASTIs who have emerged to provide us with a new set of threats to contend with? Anthony Lake, national security advisor to President Bill Clinton, has identified a number of such “rogue,” “outlaw,” or “backlash” states: Iraq, Iran, North Korea, Libya, and Cuba. He singles out the Islamic Republic of Iran and the dictatorship of Iraq for “dual containment.”³ Lake concludes that in Saddam Hussein’s Iraq, “the regime is responsible for both war crimes and crimes against humanity, a regime whose invasion of Kuwait and gassing of its own people have rendered it an international renegade.”⁴ Lake also condemns Iran as the “foremost sponsor of terrorism and assassination worldwide.”⁵

North Korea is the third NASTI regime to pose a major threat to the vital interests of the US and its allies. Its army is massed along the demilitarized zone (DMZ) near the 38th parallel on the Korean Peninsula, threatening the Republic of Korea (ROK). Its regime has sponsored numerous international terrorist acts, including the destruction of a South Korean airliner and the bombing of a South Korean government cabinet meeting in Rangoon, Burma (now Myanmar), in October 1983, which resulted in the death of 18 ROK officials.⁶ North Korea may or may not have already acquired a nuclear weapon capability, but the director of the Central Intelligence Agency (CIA) has testified that the country probably has enough special nuclear material to have built at least two nuclear bombs. It is not clear whether the Democratic People’s Republic of Korea (DPRK) is just short of the nuclear threshold or just beyond it.⁷ Other future NASTIs may include Libya, Cuba, and Syria.

NASTI Strategies

In the event of a future major regional conflict (MRC), how can the US and its allies cope militarily with rogue states like these once they have acquired NBC and missile capabilities for use on the battlefield? A first step would entail understanding the strategies such opponents might try against us. Iran, Iraq, North Korea, and other regimes that are arming with weapons of mass destruction (WMD) and that export terror and aggression against the US and its allies may choose

among at least four strategies to gain their ends in armed conflicts with allied coalitions.⁸

Fracture the Allied Coalition

One must realize that forming an allied coalition against a state with NBC weapons is no easy task, especially if it appears likely that the state can and probably would deliver them effectively against allied forces and capitals. Vulnerable allied governments within range of enemy WMD may well decide to remain neutral even in the face of regional provocations rather than risk massive losses to their forces and societies in war with such radical, well-armed regimes.

Indeed, it is important to realize that different allies could have vastly different stakes in an MRC. A WMD attack on the capitals or a few major cities of some states could threaten their national existence. Many states of the Middle East and Persian Gulf are, in one analyst’s words, “one-bomb states.”⁹ That is, a single NBC weapon effectively delivered against a major population center might shatter the political and economic life of these states and could terrorize citizens remaining in the countryside. Contrast this situation to the more modest stakes of the US, which might risk its expeditionary force in the region but otherwise might lay outside the reach of enemy aircraft and missiles carrying WMD. Nor is it certain that the enemy could effectively target the US by unconventional means of delivery. Because of its two ocean buffers and intercontinental distances from most rogue states, the US still enjoys what has been called a “zone of peace” not available to less fortunate smaller regional powers nearer the conflict zones that contain hostile, radical regimes.

Defeat the United States at Home

Another enemy strategy involves bringing about a political defeat by inflicting high allied casualties. NASTIs might seek to maximize US and allied casualties in a short time to influence US and allied public opinion to oppose the war effort. This strategy is as old as the Vietnam War, which was lost in the US rather than on the fields of battle in Indochina. The future loss of thousands of

troops in a few hours as a result of one or more enemy WMD strikes could force the US and some of its coalition partners to retire from the field, driven away by domestic political opposition and fierce internal criticism of the mounting death toll.

Even advanced conventional weapons accumulated by a hostile regional opponent could inflict large-scale allied casualties. As one analyst of war and military technology concludes,

Ultimately, the net effect of the progress in weapons technology was to increase enormously the volume of fire that could be delivered, the range at which it could be delivered, and the accuracy with which this could be done. The combination of all three factors meant that . . . the battlefield became a more deadly place than ever before.¹⁰

As a result of increased lethality in the combat zone and of subsequent military adaptations to this fact, the number of troops deployed per square kilometer has shrunk steadily over the centuries from 100,000 in antiquity; 4,790 in the Napoleonic wars; 3,883 in the US Civil War; 404 in World War I; and 36 in World War II to just 2.34 in the Persian Gulf War of 1991.¹¹

Thus, the area occupied by a deployed force of 100,000 troops has expanded as technological innovation has increased communications, rapid movement, and the range and lethality of weapons. In antiquity, such an army occupied one square kilometer; in the Napoleonic wars, 20; in the US Civil War, 26; in World War I, 248; in World War II, 2,750; and in the Gulf War, 213,000. Another way of expressing this density is the number of square meters per man: 10 in antiquity; 200 in the Napoleonic wars; 258 in the US Civil War; 2,475 in World War I; 27,500 in World War II; and 426,000 in the Gulf War.¹²

US participation in the United Nations (UN) peace operation in Somalia was sharply curtailed after millions of US citizens viewed Cable News Network (CNN) broadcasts of captured US troops being paraded through Mogadishu and of dead US troops being dragged through the streets by Gen Mohamed Farah Aidid's clansmen. It does not tax the imagination to envision the response of the US public if tens of thousands of troops were to die in a future conflagration.

One should note that during the Reagan administration, the US quickly withdrew its peacekeepers from Lebanon after over 200 US marines were killed by a truck bomb driven into their compound. Instantaneous, worldwide visual communications virtually guarantee that enemy infliction of large numbers of casualties in a short time frame can have decisive negative political consequences for any administration directing US forces into combat abroad.

Defeat US and Allies In-Theater

A third enemy strategy entails striking with NBC weapons to inflict a decisive theater defeat on the allies. Use of WMD or even very advanced conventional weapons may so shatter a US allied expeditionary force that the US could not achieve victory short of all-out nuclear war or without sending almost a full replacement expeditionary force—a process that could take months or even years. Such an attack could provoke a two-way WMD war that might leave the region in chaos or that might force the allied coalition to withdraw to arrange a compromise peace or to prepare for a longer and more costly war.

Secure the Endgame

Last, the enemy may choose to withhold attacks with WMD in favor of using these weapons as bargaining leverage to achieve his goals in the endgame phase of the conflict. Rulers about to be deposed—and possibly executed—may risk NBC escalation even against the world's ranking superpower and may use such threats to continue in power even after a clear defeat on the conventional battlefield.

Countering Threats from Enemy Weapons of Mass Destruction

The basic question to be answered is, Once a major regional conflict has begun, how can the US and its regional allies secure their objectives and defeat these four enemy strategies—and do so without massive losses of life, property, or military capability? Given the devastating capabilities of WMD,

Table 1
US Military Strength

- 1,547,300 total active duty personnel and 2,045,000 reserves
- 12,245 tanks and 11,374 armored fighting vehicles
- 8,624 artillery pieces
- 361 active duty Army aircraft; 1,584 Navy aircraft; 498 Marine Corps aircraft; approximately 936 Air Force tactical fighters; about 1,875 Air Force specialized tactical aircraft; and 204 Air Force long-range strike bombers
- 353 commercial aircraft in the Civil Reserve Fleet
- 7,227 Army helicopters (1,595 combat); 176 Navy helicopters; 465 Marine Corps helicopters; 133 Coast Guard helicopters; 120 Air Force/Special Operations Forces helicopters
- 2,655 Air Force Reserve tactical combat aircraft, plus 854 in storage; 551 Air Force tanker aircraft; 1,114 Air Force transport aircraft; and 1,198 Air Force training aircraft, plus another 143 in storage
- two Navy Reserve squadrons of F-18s; one of F-14s; one of E-2Cs; one of EA-6Bs; nine of P-3s; and one wing of helicopters (five squadrons); and six squadrons of Air Force Reserve helicopters
- US naval vessels, including 12 aircraft carriers; 137 principal surface combat ships; 123 military sea-lift ships plus 123 in the Ready Reserve; 20 Naval Reserve ships; 116 ships in the Naval Inactive Reserve Force; and 82 attack submarines
- strategic nuclear forces comprised of 16 ballistic missile submarines; up to 94 B-52 bombers; 95 B-1 bombers; 20 B-2s; 50 Peacekeeper intercontinental ballistic missiles (ICBM); and 450/500 Minuteman III ICBMs.

Source: International Institute for Strategic Studies (IISS), *The Military Balance, 1995* (London: IISS, 1995), 13–33.

the US and its allies would be wise to adopt a multifaceted approach to avoiding crippling enemy blows while pursuing regional military victory in conflicts with NASTI states. Such a wartime counterstrategy, designed to defeat the four adversary WMD strategies, will inevitably include one or more of the following: (1) deter enemy action by maintaining escalation dominance, (2) maintain the ability to destroy enemy WMD through offensive actions, (3) disperse and move forces and means of supply to complicate enemy targeting, (4) stay outside the range of en-

emy firepower with main force units, and (5) build effective active and passive defenses against WMD attacks.

Deterrence: Increase Safety through Escalation Dominance

As the world's remaining superpower, the US has clear WMD and conventional superiority over regional adversaries. As the Department of Defense's (DOD) *Bottom-Up Review* outlined, "Potential regional adversaries are expected to be capable of fielding military forces in the following ranges":

- 400,000 to 750,000 total military personnel under arms
- 2,000 to 4,000 tanks
- 3,000 to 5,000 armored fighting vehicles
- 2,000 to 3,000 artillery pieces
- 500 to 1,000 combat aircraft
- 100 to 200 naval vehicles, primarily patrol craft armed with surface-to-air missiles and up to 50 submarines
- 100 to 1,000 Scud-class ballistic missiles, some possibly with NBC warheads.¹³

Contrasting these assets to US military power (table 1) makes obvious the fact that the US enjoys escalation dominance against any single NASTI force now in existence—if the US could focus on a single theater of operations at one time.

One must also consider the military strength of US regional allies that might form a coalition against a NASTI adversary—witness the contributions of members of the anti-Iraq coalition formed during the Gulf War of 1991 (table 2). Clearly, a regional enemy should be deterred from war with the US, based on a rational and clear-headed calculation of the balance of military power in the region, whether the adversary be in the Middle East, the Persian Gulf, the Korean Peninsula, or North Africa.

In a future conflict with a rogue state armed with WMD, forming such coalitions may prove difficult unless the alliance is equipped with very effective active and passive defenses, unless deterrence through escalation dominance is guaranteed, and unless coalition forces are widely dispersed and mobile. However, deterrence as a means either of preventing war or of curbing the

Table 2
Gulf War Coalition

United States	430,000 troops; about 2,000 tanks; 1,800 aircraft; more than 100 ships, including six aircraft carriers
Turkey	Over 100,000 troops deployed along the Turkey-Iraqi border; two warships in the Gulf; seven ships in the Eastern Mediterranean
Saudi Arabia	66,000 troops; 550 tanks; 300 aircraft; eight ships
United Kingdom	35,000 troops; 120 tanks; 60 aircraft; 18 ships
Egypt	30,000 troops; 400 tanks
France	17,000 troops; 350 tanks; 38 aircraft; 14 ships
Syria	19,000 troops in Saudi Arabia; 50,000 troops along Syrian-Iraqi border; 270 tanks
Gulf Cooperation Council (GCC) States	10,000 frontline troops
Kuwait	7,000 frontline troops; 34 aircraft
Bangladesh	6,000 troops
Pakistan	2,000 troops in Saudi Arabia; 3,000 troops in United Arab Emirates (UAE)
Morocco	2,000 troops
Canada	three ships; 30 aircraft
Germany	five minesweepers; three other ships; 18 aircraft
Netherlands	three ships; 19 aircraft
Italy	four minesweepers; six other ships; eight aircraft
Belgium	two minesweepers; four other ships; six aircraft
Spain	three ships
Australia	three ships
Argentina	100 troops; two aircraft; two ships
Senegal	500 troops
Niger	480 troops
Czechoslovakia	200 troops; 150 medics
New Zealand	two aircraft; medics
Greece	one ship
Denmark	one ship
Norway	one ship
Portugal	one ship
Poland	one hospital ship; medics
Sweden	medics
Bulgaria	medics

Source: Drawn from "Contributions to the Multinational Coalition," in *The Middle East*, 8th ed. (Washington, D.C.: Congressional Quarterly, Inc., 1994), 113.

escalation of war has its limits. Deterrence will work only if the US has a retaliatory capability perceived to be capable of inflicting "unacceptable damage" on the leadership, forces, or homeland of the enemy state. Further, an adversary must believe that the US-led coalition is *willing* to escalate the conflict to such an extent that it can cause "unacceptable damage," even if doing so entails substantial casualties. Finally, for de-

terrence to work, the enemy leaders must be rational, acting to preserve themselves and their citizens. Clearly, though, some NASTI leaders might not be deterred by the overwhelming escalation dominance that the US and its allies are able to assemble in the Persian Gulf and on the Korean Peninsula.

During the Gulf War, Iraq had the means of using some NBC weapons: chemical munitions,

at a minimum, and possibly some biological weapons as well. After the war, UN inspectors on the ground found—and subsequently destroyed—over 150,000 chemical munitions. Several hundreds of thousands of gallons of lethal mustard and nerve agents were produced by Iraq by 1991.¹⁴

According to Iraqi admissions, by 1991 that regime had produced “thousands of liters of botulinum toxin and anthrax and lesser amounts of a number of less well understood, but still deadly agents. Iraq has now admitted 19,000 liters of concentrated botulinum toxin—with 10,000 liters filled into shells, bombs and missile warheads, 8,500 liters of concentrated anthrax with 6,500 liters filled into weapons, and 2,200 liters of concentrated aflatoxin, 1,580 of which were weaponized. At the time of the Gulf War, biological agents had been weaponized, and missiles, artillery shells and aircraft . . . stood ready to rain their deadly payloads onto civilian and military targets.”¹⁵ Iraq claims to have destroyed all its biological warfare (BW) capability at the start of the air war in January 1991 to prevent collateral damage in the event coalition aircraft bombed its stores of BW agents. Doubts still exist among members of the coalition as to whether Iraq destroyed its biological agents and its BW research and production equipment, as it now claims, or whether they were hidden and still exist in some form, to be resurrected when the occasion permits.

Allied weapons specialists have concluded that the Iraqi regime had not yet mastered chemical warfare (CW) and BW reentry vehicles for its ballistic missiles and that its reentry vehicle technology was relatively unsophisticated. However, there are other means of delivering biological weapons and agents (e.g., artillery shells, bombs, sprayer aircraft, special force emplacements), all of which are well within Iraq’s capability.

After the Gulf War, experts concluded that Saddam Hussein’s technicians were two years or more away from assembling Iraq’s first A-bomb. Nevertheless, the Iraqi nuclear weapons program was much closer to success than it had been credited with prior to the war.

Thus, in 1990–91, the US had every reason to believe that it had overwhelming superiority in WMD versus Iraq, and it warned the Baghdad government about the risks of using WMD against allied forces or targets. Secretary of Defense Dick Cheney, for example, stated publicly that “were Saddam Hussein foolish enough to use weapons of mass destruction, the U.S. response would be absolutely overwhelming and it would be devastating.”¹⁶

Just to make sure there was no misunderstanding, President George Bush sent Saddam Hussein a letter stating that “the United States will not tolerate the use of chemical or biological weapons. . . . The American people would demand the strongest possible response. You and your country will pay a terrible price if you order unconscionable acts of this sort.”¹⁷

Even given the overwhelming US nuclear superiority against any likely regional adversary, such escalation dominance does not automatically translate into deterrence of war with such regimes. US deterrence policy could fail for a number of reasons.

First, enemy leaders might believe that the US and its allies lack the will to win a regional conflict if confronted with the possibility of horrific losses from WMD attacks. Leaders such as Kim Jong Il or Saddam Hussein might gamble that the US would back down in future contingencies rather than endure such casualties.

Second, adversary leaders might misread the degree of political support or political courage possessed by the US president in an MRC. They therefore might risk escalating the conflict, based on their view of how US domestic politics would impose limits on the US commander in chief.

Third, adversary leaders might operate in a world of their own, surrounded by yes-men and cut off from realistic intelligence about the US, its allies, and their intentions. Either US government representatives might not have sufficiently communicated US resolve or the enemy leaders might disregard the messages and intelligence reports they receive, preferring to adhere to previous stereotypes or misinformation.

Fourth, some adversary leaders might have such a different worldview or set of values that

they would not be deterrable—or would respond to different kinds of threats than those made. For example, not all leaders act the same when their backs are to the wall and they must make decisions under stress in a crisis. Some might respond to threats of retaliation against their people or forces, and some might not care unless they themselves or their political power were directly threatened. Some might decide to strike out and attack with WMD if their regimes were about to fall. Some might escalate to strike a hated enemy, especially if they calculated that doing so might marshal support at home or in the region. Some might be religious or cultural zealots who would stop at nothing to destroy some hated adversary, leaving the consequences to chance. Others might care more about their place in history than the immediate consequences of using NBC weapons first. Not all leaders will be deterrable in every circumstance, even if the US and its allies have both the will and the capability of inflicting unacceptable damage.

Finally, deterrence assumes that state leaders can control their subordinates. Some unauthorized use of WMD might occur if fanatical elements of the armed forces or terrorist groups acquired these weapons. Deterrence of nonstate actors, whose agenda, identity, and location may be unknown, could be far more difficult than deterrence of state actors, who can be more readily identified, located, and punished.

Destruction: Elimination of Enemy Weapons of Mass Destruction

One path to increased safety in MRCs is to develop offensive counterforce capabilities to destroy enemy WMD assets in crises or wartime. This course of action includes the ability to target underground structures housing WMD assets, mobile launchers of missiles with NBC warheads, research laboratories and production plants used to develop and produce WMD and missiles, and facilities for testing NBC and missile systems.

Perhaps the most difficult task in applying counterforce is locating the appropriate WMD target set. US and allied intelligence in the Per-

sian Gulf War of 1991 failed to locate 18 of the 20 Iraqi nuclear facilities associated with the research and development (R&D) and production of nuclear weapons. Indeed, intelligence was so poor that allied air forces could not register a single confirmed Scud kill during the entire conflict. Iraqi CW and BW assets were similarly opaque to the allies during the war.

Unlocatable targets are unlikely to be destroyed. Full, precise, and timely intelligence is the key to effective offensive operations against enemy WMD and delivery assets. Unfortunately, it is relatively easy to miss significant portions of the WMD available to states like Iran, Iraq, and North Korea due to the small size of such weapons, the ability to disperse and hide them, the lack of allied human-intelligence networks built up within such societies, and the secrecy and police apparatus employed by such regimes. This counterforce targeting problem is compounded by the mobility of such assets (e.g., Scuds on mobile transporter-erector-launchers), the use of decoys, the hardening of storage and launch sites (e.g., deeply buried underground bunkers), and the presence of active defenses around key sites to intercept and destroy incoming missiles or aircraft. Indeed, if directed against an enemy that hitherto had not escalated to the use of WMD in a conflict, counterforce attacks that were detected or that had become effective might precipitate enemy “use or lose” decisions on remaining WMD assets.

Once war has begun, there is no guarantee that adversaries will not use any weapon at their disposal. Clearly, preemption or counterforce targeting is one means of limiting damage to allied forces if those forces can locate, attack, and destroy a significant portion of WMD before the enemy can use these weapons.

Unfortunately, the US or its allies need to do much hard R&D work before they can achieve even a modest counterforce targeting capability against fixed, deeply buried hardened targets and against mobile missile launchers. The inability of the allies to confirm even one kill of an Iraqi Scud launcher despite having air supremacy in the Gulf War is a sobering fact that indicates how much remains to be done. The present state of

the art appears to be far from solving target-acquisition and target-destruction problems—especially with conventional weapons. The task of defeating enemies with WMD research, production, or deployments through counterforce targeting is made even more difficult because of the reluctance of the US and its allies to use their own WMD to destroy enemy WMD assets for a number of reasons.

First, US and allied officials would want to preserve international norms against the use of WMD established over the past several decades. This antinuclear-use taboo is at the heart of US nuclear nonproliferation policy efforts. Breaking it would undermine the nonproliferation regime that the US has worked so hard to construct in the past 50 years.

Second, international and domestic audiences are likely to condemn the use of WMD by anyone. Such usage could cause major domestic political upheavals and changes of governments in democratic countries. It could also lead to legal, political, economic, and diplomatic difficulties with other states.

Third, international treaties such as the Nuclear Nonproliferation Treaty (NPT) make the use of nuclear weapons against any signatory state illegal. Such use would also contradict previous US and allied pledges not to use WMD against NPT, Biological Weapons Convention (BWC), and Chemical Weapons Convention (CWC) signatory states.

Fourth, collateral damage from WMD attacks might be heavy in the region. Allied policy seeks to avoid inflicting casualties on innocent civilian populations.

Fifth, nuclear fallout from attacks on enemy nuclear reactors could kill or disable allied forces and nearby populations. These casualties, in turn, would also create serious military, diplomatic, economic, and political problems.

Sixth, a US nuclear attack to disarm an enemy state's WMD capability may jeopardize US citizens and businesses abroad. Further, it might lead to hostage taking or retaliatory attacks against US embassies and corporate facilities.

Seventh, US use of nuclear arms to destroy a rival's WMD capability could stimulate others to

acquire WMD. This action would serve either as a deterrent to future US action or as a potential preemptive tool or war-winning weapon against regional adversaries, once the US had shattered the taboo against WMD use.

Therefore, US defense officials will be pressured to develop conventional rather than WMD counterforce weapons. Unfortunately, doing so would decrease the probability of military success in counterforce strikes in wartime but would also help avoid problems associated with the use of WMD.

Dispersion: Step toward Greater Safety

As previously discussed, the US and its allies would suffer fewer casualties from any conventional or WMD strike if they present less lucrative targets to the enemy. They can accomplish this by

- Spreading allied forces over even wider areas.
- Dispersing more such forces on mobile platforms.
- Keeping significant forces in motion at all times.
- Spreading the logistics tail to offer fewer concentrations of supplies, transports, and logistical workers.
- Dispersing food and supplies to allied forces through multiple rather than just a few land, sea, or air pathways into the theater of operations.
- Moving reinforcements, equipment, food, and supplies more rapidly through choke points to provide fewer lucrative targets by reducing loiter time in the landing and embarkation zones.

The US Army Force XXI operations report suggests that “as armies seek to survive, formations will be more dispersed, contributing to the empty battlefield. Commanders will seek to avoid linear actions, close-in combat, stable fronts, and long operational pauses.”¹⁸

Of course, dispersion is not possible for all targets. For example, a seaport, an air base, and a city cannot be relocated even though the number of ships, aircraft, or population residing in such vulnerable areas can be reduced by dispersion and evacuation.

Dispersion definitely reduces the vulnerability of military forces. For example, as one study

notes, "Force densities employed in NATO, and in the 1991 Persian Gulf War, were typically low enough to ensure that no more than 1–2 companies (300–500 troops) would have been lost to a well-aimed 30 kiloton nuclear weapon."¹⁹ Tanks and armored personnel carriers (APC) within half a mile of a 30-kiloton nuclear detonation would be destroyed, so armored forces would need to be dispersed and frequently on the move.²⁰

Infantry units should spread out so that no more than a company of 150 to 250 troops could be lost to a 30-kiloton explosion.²¹ This means maintaining a troop density of no more than one company within an area having a 3.5-kilometer (2.17-mile) radius—or one company for every 14.8 square miles. (Ironically, since the end of the cold war and the removal of nuclear arms from US Navy ships and from Army ground forces, there are far fewer decontamination drills and nuclear contingency exercises to prepare sailors and troops for a possible NBC environment.) This kind of dispersion conforms with the ultimate aim of the US Army's Force XXI program, designed to increase unit firepower while reducing the number of unit personnel. The Army is already heading in the direction of using fewer troops to direct more lethal firepower over wider areas, a move that meshes with the need to reduce possible losses via dispersion on the regional battlefield of the future.

Dispersion of the allied logistics tail can also make for fewer lucrative targets available to enemy WMD. One reduces vulnerability by using more ports and airfields to project power into an MRC region. Storing supplies in ships offshore and injecting them more rapidly into battle zones reduces vulnerability even further. More, smaller, and faster logistics ships could also enhance logistics survivability. The development of more over-the-beach delivery methods by the Navy and the development of cargo aircraft that can land and take off from austere air bases can also contribute to the survivability of allied logistics in future MRCs.

Finally, if the US and its allies cannot make the logistics tail of their present forces adequately survivable, they may need to redesign the composition of MRC fighting forces, their equipment,

and methods of war fighting in the theater. The military may be forced to modify its way of fighting wars not only in response to the threat of adversary WMDs but also in response to the revolution in conventional high-tech weapons and technologies. As one defense reporter has observed,

The revolution derives not from any single invention or idea, the argument goes, but from a range of rapidly developing technologies that involve more powerful sensors and computers, radar-evading technology, precision-guided munitions and fiber optic communications systems. To make full use of these technologies, and defend U.S. forces against potential adversaries with them, and with NBC and missile capabilities, U.S. military services would be wise to move away from the notion of fighting in relatively large, sluggish, and easily detectable land armies and aircraft carrier fleets. Instead, advantage on the future battlefield, it is said, will fall to smaller, more mobile military units that rely on stealth technology and electronic warfare to evade enemies. [Such units] will survive on logistical support systems much leaner than existing ones.²²

Distance: Outranging the Opponent

As discussed previously, another method for engaging the NASTI is to stay out of range and strike his forces from afar until it is safe to close with them on the ground and terminate the conflict. The US already has the tools to outrange most opponents. For instance, in the Gulf War, US strategic bombers based in the continental US hit targets in Kuwait and Iraq and were an important part of the air campaign.

Obviously, a strategy of remote engagement relies upon air superiority over the theater of operations, superior long-range striking power, and very much improved intelligence to locate targets and to provide real-time damage assessments. Without conventional ground and naval forces engaging the enemy close in, it could be difficult to find, fix, and compel the formation of sizable enemy force concentrations for allied targeting purposes. One needs some form of more conventional warfare to prevent the enemy from widely dispersing his forces and moving at will. A suc-

successful air campaign at the front requires an allied army presence to make the enemy group his forces.

Defense: The Long Pole in the Tent

Against an Iran, Iraq, North Korea, or other rogue state armed with WMD, a US counterproliferation strategy that relies on deterrence, offensive counterforce capabilities, dispersion, and strikes against the enemy from afar still might not prevail unless it is enhanced by defense. Unless it faces very effective US and allied active and passive defenses, a well-armed rogue state may still be able to (1) frighten potential allies from joining a US-led coalition, (2) inflict so many casualties that US public opinion may force US withdrawal from the conflict, (3) defeat US and allied forces arrayed in the theater, or (4) escape the consequences of aggression—even if it is on the ropes—because its residual WMD threat might prevent the allies from securing a full victory that includes imposing a change of regime. Effective active and passive defenses, added to the other elements of a counterproliferation strategy, could make US and allied wartime operations far less risky and more likely to succeed.

Failure to prepare for the NBC battlefield is the path to a WMD disaster of epic dimensions that might dwarf other defeats in the history of warfare.

Effective defenses would have to be good enough to protect expeditionary forces as they embark through air bases and ports of entry, to cover allied capitals and cities in the region, to protect allied forces in the field, and to prevent WMD blackmail from being credible. Such defenses would have to be numerous enough and layered—perhaps including at least two theater missile defense (TMD) and air defense layers capable of a 90 percent probability of kill in each layer—to defeat the four enemy strategies addressed above.

For example, if allied forces operated from 25 air bases in the Persian Gulf region in a future conflict and if the enemy had 50 ballistic missile warheads armed with nuclear or biological weapons, then an all-out enemy attack would destroy just one allied air base if the two TMD systems in place (Theater High-Altitude Area Defense [THAAD] and advanced Patriot [PAC-3] interceptor) were capable of 90 percent lethality in one-on-one interceptions. Twenty-four of the 25 allied air bases would survive this enemy WMD missile strike.

On the other hand, if allied two-layered TMD systems were only 50 percent effective, half of the 25 air bases would be destroyed. If there were only one layer of theater missile interceptors, each 50 percent effective, all 25 air bases would perish. Virtually everything, therefore, depends on the effectiveness and thickness of the TMD deployed to protect such fixed assets as air bases, ports, or cities. The performance of TMD is the long pole in the tent, since it is vital to protecting key fixed sites.

Passive defenses are also of great importance in facing an adversary armed with nuclear and, especially, biological or chemical weapons. Allied soldiers will require vaccinations against as many of the “dirty dozen” biological agents that might be used against them. DOD should make such a program an immediate priority. Further, we need more effective mission oriented protective posture (MOPP) suits for BW and CW environments, and we need to conduct more exercises and war games that include potential enemy NBC weapons as part of the scenario and training. Further, we need far more research in detecting BW and CW agents prior to their arrival in the midst of allied troop formations or bases. We need to standardize NBC warning and reporting systems between our military services and between allied and US forces. We need still more work in running allied air, sea, and land military operations in the midst of enemy NBC attacks and environments. We also need to improve and extend training in decontaminating NBC environments on bases and battlefields.

Without such US and allied theater missile, air, perimeter, and passive defenses, the four ad-

versary WMD strategies would have a reasonable chance of success against the US and its coalition partners, since no allied city or military buildup would be safe. If these kinds of effective defenses can be developed and deployed in sufficient numbers, the five allied counterstrategies—deterrence, dispersal and mobility, outranging the enemy, offensive counterforce targeting, and active and passive defenses—can neutralize the rogue strategies and open the way to hard-fought allied victories in future MRCs against heavily armed states.

Preparing for the NBC Battlefield

Failure to prepare for the NBC battlefield is the path to a WMD disaster of epic dimensions that might dwarf other defeats in the history of warfare. More US and allied troops could be lost in an afternoon than were lost in either the Korean War or the Vietnam War if we are not pre-

pared. Successful WMD preparation and the advertisement of this fact to potential adversaries may prevent this nightmare scenario from developing.

If NBC warfare does come, US and allied forces will need such preparations to survive and have a chance at success in the most lethal situation ever faced by military units or allied states. The responsibility for preparing US military forces for such contingencies lies with the regional commander in chief (CINC) or war-fighting CINC as well as the Joint Chiefs of Staff, the secretary of defense, and the president. The US counterproliferation initiative that began in late 1993 is only a good start down a long road before we are prepared adequately for such a lethal contest of arms or before we have the ability to thwart the strategies of rogue states armed with weapons of mass destruction. □

Notes

1. Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction: Assessing the Risks* (Washington, D.C.: Government Printing Office, August 1993), 66.
2. US Department of State, "State-Sponsored Terrorism," in *Patterns of Global Terrorism*, 1994 (Washington, D.C.: Department of State, 1995), 19–24.
3. "Lake Calls Iran and Iraq 'Outlaws,'" *Washington Post*, 28 February 1994, A-15.
4. Anthony Lake, "Confronting Backlash States," *Foreign Affairs* 73, no. 2 (March–April 1994): 8–13.
5. Ibid.
6. US Department of State, "State-Sponsored Terrorism," 23. See also Brian Jeffries, "The Slaughter in Rangoon," *Maclean's*, 17 October 1983, 45.
7. Senate Committee on Government Operations, *Opening Statement by R. James Woolsey on Proliferation Threats of the 1990s*, 103d Cong., 1st sess., 24 February 1993, mimeographed, 10. See also Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction*; Paul Bracken, "Nuclear Weapons and State Survival in North Korea," *Survival* 35, no. 3 (Autumn 1993): 121–36; and International Atomic Energy Agency (IAEA), "Consolidated Report on the First Two IAEA Inspections under Security Council Resolution 687 (1991) of Iraqi Nuclear Capabilities," S/22788 (New York: United Nations Security Council, 11 July 1991).

8. See Victor A. Utgoff and Jonathan Wallis, "Carrying Out Major Regional Contingencies against States Armed with Weapons of Mass Destruction: A First Order Solution," draft analysis (Washington, D.C.: Institute of Defense Analysis, 30 January 1995), 4–5.
9. Anthony H. Cordesman, *Iran and Iraq: The Threat from the Northern Gulf* (Boulder, Colo.: Westview Press, 1994), 111, 274.
10. Martin van Creveld, *Technology and War: From 2000 B.C. to the Present* (New York: Free Press, 1989), 171.
11. Gen Gordon R. Sullivan and Col James M. Dubik, "Land Warfare in the 21st Century," *Military Review*, September 1993, 22. These statistics, excluding those for the Gulf War, are from Trevor N. Dupuy, *The Evolution of Weapons and Warfare* (Fairfax, Va.: Hero Press, 1980), 312.
12. Dupuy, 22.
13. Les Aspin, *The Bottom-Up Review: Forces for a New Era* (Washington, D.C.: Department of Defense, 1 September 1993), 5.
14. David Kay, "Detecting Cheating on Non-Proliferation Regimes: Lessons from Our Iraqi Experience" (Paper presented at the Air War College Conference on Nuclear Nonproliferation Issues, Maxwell AFB, Ala., 27 April 1996), 2.
15. Ibid. Iraqi officials admit to having manufactured "191 BW warheads—166 bombs (100 filled with botulinum toxin, 50 with anthrax and 16 with aflatoxin) and 25 Al Hussein missile warheads (13 filled with botulinum toxin, 10 with anthrax and 2 with aflatoxin) and

an aerial spraying system designed to spray 2,000 liters of agent over a target.”

16. *Conduct of the Persian Gulf War: Final Report to Congress*, vol. 1 (Washington, D.C.: Department of Defense, April 1992), 25.

17. President George Bush, “Crisis in the Gulf,” *U.S. State Department Dispatch* 2, no. 2 (14 January 1991): 25.

18. US Army Training and Doctrine Command (TRADOC) Pamphlet, *Force XXI Operations: A Concept for the Evolution of Full-Dimensional Operations for the Strategic Army of the Early Twenty-First Century*, 1 August 1994, 2–9.

19. Utgoff and Wallis, 12.

20. Noted in *ibid.* All the calculations of nuclear effects are based on Samuel Glasstone and Philip J. Dolan, eds., *The Effects of Nuclear Weapons*, 3d ed. (Washington, D.C.: Department of Defense, 1977), chap. 1.

21. *Ibid.*

22. Bradley Graham, “Battle Plans for a New Century: Smaller, Mobile Units Stressed as Military Harnesses Range of Technologies,” *Washington Post*, 21 February 1995, 1.

Dr Barry R. Schneider (PhD, Columbia University) is a professor of international relations at the Air War College, Maxwell AFB, Alabama. Formerly, he served as director of national security studies for the Harris Group in Reston, Virginia, and as foreign affairs officer for the Arms Control and Disarmament Agency. Dr Schneider coedited *Battlefield of the Future: Twenty-first Century Warfare Issues* (1995).

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